

Patent
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In the Claims

1. - 82. Canceled

83. (Currently Amended) A method for processing and recording video signals generated by a plurality of video transmitters and propagated via video transmission lines to a recording receiver for outputting processed video signals and for feeding each of said processed video signals mixed with individually allotted code signals in timed sequence to a digital recorder;

said code signals are generated and mixed into said video signals through at least one code generator and mixer circuit selected from a group consisting of individual code generator and mixer included in each of said transmitters, individual code generator and mixer extended along each of said transmission lines, multiple code generator and mixer included in said recording receiver and a combination thereof;

said recording receiver including at least one timing circuit selected from a group consisting of a synchronous switch, time base corrector, external synchronizing generator, parallel video signals compressing circuit, parallel to serial converter and a combination thereof for processing and organizing the timing of said video signals and for outputting said processed video signals selected from a group consisting of externally synchronized, time base corrected, compressed, parallel to serially converted and a combination thereof in said timed sequence to said digital recorder having at least one main memory storage device for routine recording of said video signals in endless sequence rotation, and at least one secured memory selected from exclusive memory device and a portion of said main memory for retaining said video signals recorded during an alarm state and an alarm data signal input for triggering said alarm state, the method comprising the steps of:

extracting said identification code from each sequencing individual video signal, for routinely storing individual processed video signals one after another in sequence along with the extracted identification code thereof, on the basis of the time and date of said routine recording, into said at least one main memory storage devices, one after

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another, each to its capacity, in endless cascaded rotation, wherein freshly recorded signals replace the oldest stored signals; and

at least one of duplicating and transferring said signals recorded during said alarm state to said at least one secured memory, thereby retaining and protecting said signals recorded during said alarm state from routine replacement by said freshly recorded signals;

retrieving said stored signals from said at least one main memory storage device and said at least one secured memory on the basis of said time and date of the routine recording of at least one of said stored signals and said stored identification code, and said alarm data signal; and

decompressing the retrieved signals and re-injecting said identification code signals, with or without the time and date signals of the time and date of the recording of said retrieved signals, and with or without said alarm data signal into the vertical blanking portion of the decompressed video signals for outputting said decompressed video signals to a monitor and a playback receiver.

84. (Previously Presented) The method as set forth in claim 83, wherein said transmitters are externally synchronized and the synchronizing of said plurality of transmitters further comprises the steps of:

transmitting from said external synchronizing generator a pulse signal having a voltage level higher than a maximum voltage level of said video signals or lower than a minimum voltage level of said video signals to respective transmitting means over said video transmission lines as an external synchronizing signal by using blanking level portions of the video signals;

separating said pulse signal transmitted over said transmission line from said video signals by comparing said video signals to a reference signal having a predetermined voltage level; and
applying said separated pulse signal to respective transmitting means.

85. (Previously Presented) The method as set forth in claim 84, wherein said pulse signal is opposite in polarity to an internal synchronizing signal which is contained in each of said video signals.

86. (Previously Presented) The method as set forth in claim 83, which for synchronizing said plurality of transmitters further comprises the steps of:

transmitting an external synchronizing signal from said external synchronizing generator selected from one of a horizontal and vertical drive signal, or vertical drive signal, or composite signal, or horizontal and vertical drive signal, a vertical drive signal, a composite signal, a horizontal signal and a vertical signal over said transmission lines; and

receiving said signal transmitted over said transmission line and applying said signal to respective video transmitters.

87. (Previously Presented) The method as set forth in claim 83, which for mixing said identification code signal with said video signal further comprises generating said individually allotted identification code for each individual signal of said video signals for injecting said individually allotted code into one of said transmitters, or anywhere along said video transmission line, or at an input of said synchronous switch.

88. (Previously Presented) The method as set forth in claim 87, which for mixing said identification code signal with said video signal, further comprises generating plurality of said individually allotted identification codes for the plurality of said transmitters and injecting said individually allotted identification codes into said processed video signals on the basis of each sequencing step by one of said synchronous switch and said parallel to serial converter.

89. (Previously Presented) The method as set forth in claim 83, wherein said alarm data signal is combined with said recorded signals during said alarm state.

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90. (Previously Presented) The method as set forth in claim 83, wherein said step of at least one of duplicating and transferring said signals recorded during said alarm state to said at least one secured memory further comprises extending said step of at least one of duplicating and transferring recorded signals to include signals recorded prior to said triggering of said alarm state and after said alarm state has been cleared.

91. (Previously Presented) The method as set forth in claim 83, further comprises of the steps of:

at least one of duplicating and transferring any of said stored signals by selecting one of the time and date of recording of said stored signals, said identification code, and said alarm data signal to said at least one secured memory, thereby retaining and protecting any of said stored signals from routine replacement by said freshly recorded signals.

92. (cancelled)

93. (Currently Amended) The method as set forth in claim ~~83~~⁹², and further comprising the extracting at least one of the injected identification code, said time and date and said alarm data signal from said decompressed video signals for superimposing, upon command, said at least one of said code, said time and date and said alarm data signal onto a picture displayed on said monitor.

94. (Currently Amended) The method as set forth in claim ~~92~~⁸³, wherein said digital recorder further includes a directory memory for storing texts or names on the basis of said identification codes and the method further comprises retrieving a text or name from said directory memory on the basis of said code for superimposing upon command said text or name onto said picture displayed on said monitor.

95. (Currently Amended) The method as set forth in claim ~~92~~⁸³, and further comprising combining a plurality of said decompressed video signals retrieved on the

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basis of at least one of said time and date and a plurality of identification codes for displaying on command onto said monitor, one of a split picture and multi-screen picture selected from the group consisting of a picture in picture, quad picture, 9 split picture, 16 split picture and a combination thereof.

96. (Previously Presented) The method as set forth in claim 83, and further comprising cascading a plurality of said digital recorders for enlarging the total recording capacity, wherein each of said cascaded digital recorders records to a capacity thereof one after another in endless rotation, and wherein freshly processed signals replace the oldest stored signals.

97. (Previously Presented) The method as set forth in claim 96, which further comprises the steps of:

retrieving any stored signals from any of said cascaded digital recorders on the basis of said at least one of time and date of the recording of at least one of the retrieved signals, said stored identification code and said alarm data signal;

decompressing said retrieved signals and re-injecting said identification code signals, with or without the time and date signals of the time and date of the recording of said retrieved signals, and with or without said alarm data into the vertical blanking portion of the decompressed video signals for outputting said decompressed video signals to one of a monitor and a playback receiver.

98. (Currently Amended) The method as set forth in claim ~~92~~83, adapted for playing back said routinely stored signals and said signals recorded during said alarm state through said playback receiver further comprising the steps of:

extracting from said decompressed video signals at least one of said re-injected time and date of the recording, said re-injected identification code or codes and said re-injected alarm data; and

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selecting video signals for playback on the basis of said at least one of said extracted code, said time and date of the recording and said alarm data, and outputting a selected video signals to a monitor.

99. (Previously Presented) The method as set forth in claim 98, and further comprising applying at least one of the extracted identification code said time and date of the recording and said alarm data signal for superimposing upon command, one of said code, said time and date and said alarm data onto a picture displayed on said monitor.

100. (Previously Presented) The method as set forth in claim 98, wherein said playback receiver further includes a directory memory for storing texts or names on the basis of said identification codes and the method further comprises retrieving a text or name from said directory memory on the basis of said code and superimposing upon command said text or name onto said picture displayed on said monitor.

101. (Previously Presented) The method as set forth in claim 98, and further comprising combining a plurality of said retrieved video signals on the basis of said time and date and a plurality of said identification codes for displaying on command, onto said monitor one of a split picture and multi-screen picture selected from the group consisting of a picture in picture, quad picture, 9 split picture, 16 split picture and a combination thereof.

102. (Previously Presented) The method as set forth in claim 97, adapted for playing back at least one of said routinely stored signals and said signals recorded during said alarm state through said playback receiver further comprising the steps of:

extracting from said decompressed video signal said at least one of re-injected time and date of the recording, said re-injected identification code and said re-injected alarm data signal; and

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selecting video signals for playback on the basis of said at least one of said extracted code, said time and date of the recording and said alarm data, and outputting selected video signals to a monitor.

103. (Previously Presented) The method as set forth in claim 102, further comprising applying said at least one of the extracted identification code, said time and date of the recording and said alarm data, for superimposing upon command, said at least one of said code, said time and date and said alarm data onto a picture displayed on said monitor.

104. (Previously Presented) The method as set forth in claim 103, wherein said playback receiver further includes a directory memory for storing texts or names on the basis of said identification codes and the method further comprises retrieving a text or name from said directory memory on the basis of said code and superimposing upon command said, text or name onto said picture.

105. (Previously Presented) The method as set forth in claim 97, further comprising combining a plurality of said retrieved video signals on the basis of said time and date and on the basis of a plurality of said identification codes for displaying on command onto said monitor one of a split picture and multi-screen picture selected from the group consisting of a picture in picture, a quad picture, a 9 split picture, a 16 split picture and a combination thereof.

106. (Currently Amended) An apparatus for processing and digitally recording a plurality of video signals comprising:
a plurality of transmitters for generating video signals;
a recording receiver for receiving said video signals, said recording receiver includes at least one timing circuit selected from a group consisting of a synchronous switch, time base corrector, external synchronizing generator, multi video signal compressing circuit, parallel to serial converter and a combination thereof for organizing

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the timing of said video signals and for connecting said plurality of transmitters to a digital video recorder in timed sequence;

a plurality of video transmission lines for connecting said plurality of transmitters to said recording receiver;

at least one coding circuit for generating and mixing code signals corresponding to an identification code allotted to each said video signal selected from a combination coding circuits comprising coding circuit included in said transmitters, coding circuit extended along said transmission lines, coding circuit adjacent to said timing circuit and a combination thereof for mixing selectively said code signals with said video signal;

said digital video recorder including a central processing circuit, time and date signal generator, decoding/encoding circuit for receiving said video signals in timed sequence for extracting said identification codes from the received video signals, and a compression/decompression circuit for compressing said received video signal and for outputting a compressed signal along with the extracted identification codes thereof and the time and date of the recording to one of main memory selected from single memory device and plurality memory devices;

said main memory routinely stores said compressed signals along with said identification code and said time and date of the recording to its capacity, wherein freshly stored signals replace the oldest stored signals and wherein said capacity of said plurality memory devices combines said plurality memory devices in an endless cascaded rotation, one after another;

an alarm data signal input for receiving an alarm signal and for triggering an alarm state; and

at least one secure memory selected from exclusive memory device and a portion of said main memory for retaining said video signals stored during said alarm state, wherein said compressed signals routinely stored during said alarm state along with said identification codes and said time and date of the recording is subjected to as least one of duplication and transfer to said at least one secure memory, thereby retaining and protecting said recording during the alarm state from routine replacement by said freshly stored signals.

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wherein said central processing circuit retrieves said stored signals from said at least one main memory and said at least one secure memory on the basis of at least one of said time and date of the recording of said stored signal, said stored identification codes and said alarm data, and wherein said compress/decompress circuit decompresses the stored signals and said decoding/encoding circuit mixes said identification code signals, with or without the time and date signals of the recording of the retrieved signals, and with or without said alarm data, into the decompressed video signals for outputting said decompressed video signals to one of a monitor or to a playback receiver.

107. (Previously Presented) An apparatus for processing and recording plurality of video signals as set forth in claim 106, wherein said external synchronizing generator feeds said video transmission lines and said timing circuit a pulse signal having a voltage level higher than a maximum voltage level of said video signals generated by the respective transmitters or lower than a minimum voltage level of said video signal;

wherein each of said transmitters includes an externally synchronized television camera and a comparator circuit associated respectively with said television camera for separating said pulse signal transmitted over said video transmission lines from said video signals by comparing said video signals to a reference signal having a predetermined voltage level, and applying said separated pulse signal to each of said television camera for synchronizing the television cameras to each other and to said switch.

108. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 107, wherein said pulse signal is opposite in polarity to an internal synchronizing signal which is contained in each of said video signals.

109. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein said external synchronizing generator feeds external synchronizing signal selected from the group consisting of a

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horizontal and vertical drive signal, a vertical drive signal, a composite signal, and horizontal and vertical signal over said transmission lines and to said timing circuit.

110. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein said circuit for generating code signals generates a plurality of said codes allotted to each individual video signal for mixing a selected individual code with said video signals into an output pole of said timing circuit, wherein the mixed code is commensurate with the identification code allotted to a video signal connected to said output pole.

111. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein said alarm data signal is fed to said decoding/encoding circuit for mixing said alarm data signal with said stored signals during said alarm state.

112. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein said stored signals subjected to at least one of duplication and transfer, stored during said alarm state, to said at least one secure memory are extended to include stored signals, recorded at least one of prior to said triggering of said alarm state and after said alarm state has been cleared.

113. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein said stored signals subjected to at least one of duplication and transfer include any of said stored signals by selecting at least one of the time and date of the recording of said stored signals, said identification codes and said alarm data to said at least one secure memory.

114. (cancelled)

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115. (Currently Amended) The apparatus as set forth in claim ~~114~~106, adapted for playing back said routinely stored signals and said signals stored during said alarm state, wherein said encoding/decoding circuit extracts at least one of the mixed identification codes, said time and date of the recording and said alarm data from said decompressed video signals and outputs a signal to a superimposing circuit for superimposing at least one of said code, said time and date and said alarm data onto a picture displayed on said monitor.

116. (Previously Presented) The apparatus as set forth in claim 115, adapted for playing back said routinely stored signals and said signals stored during said alarm state, wherein said encoding/decoding circuit further comprises a directory memory for storing texts or names on the basis of said identification codes for retrieving a text or name from said directory memory on the basis of said code for superimposing upon command said text or name onto said picture.

117. (Currently Amended) The apparatus as set forth in claim ~~114~~106, adapted for playing back said routinely stored signals and said signals stored during said alarm state, wherein said central processing circuit further includes a picture memory circuit for combining a plurality of said decompressed video signals and outputting a combined video signal for displaying onto said monitor one of a split picture and a multi-screen picture selected from the group consisting of a picture in picture, a quad picture, a 9 split picture, a 16 split picture and a combination thereof.

118. (Previously Presented) The apparatus for processing and digitally recording plurality of video signals as set forth in claim 106, wherein a plurality of said digital recorders are connected in cascade for enlarging the total recording capacity; and wherein each of said digital recorders connected in the cascade records to its capacity one after another in endless rotation, and wherein freshly stored signals replace the oldest stored signals.

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119. (Previously Presented) The apparatus as set forth in claim 118, adapted for playing back said routinely stored signals and said signals stored during said alarm state, wherein said central processing circuit retrieves said stored signals from at least one of said main memory and said at least one secure memory on the basis of at least one of said time and date of the recording of said stored signal, said stored identification codes and said alarm data, and wherein said compressing/decompressing circuit decompresses the recorded signals and said decoding/encoding circuit mixes said identification code signals, with or without the time and date signals of the recording of said retrieved signals, and with or without said alarm data, into the decompressed video signals for outputting said decompressed video signals to one of a monitor and a playback receiver.